ABSTRACT

A shell and tube type heat exchanger - evaporator for applications involving vapour-liquid separation and evaporation of refrigerants has a plurality of heat exchange tubes provided with an internal baffle that converts the straight tube channel of a standard heat exchange tube into two semi - circularly sectioned spiral channels. The two spiral channels define a spiralling flow path for the vapour generated in the heat exchange tube from a boiling liquid. The generated vapour flows through the two spiral channels with increasing velocity driving the unevaporated boiling liquid in a spirally rotating film of diminishing thickness over the whole internal wall of the heat exchange tube increasing the heat exchange capacity of the heat exchange tube. The fine droplets of the boiling liquid generated during the boiling process are continuously separated from the stream of the generated vapour by impingement on the body of the internal baffle and by centrifugal acceleration of the spiralling flow of the generated vapour. Because of the rotation of the vapour and boiling liquid in the heat exchange tube, the heat exchanger-evaporator can operate with high efficiency in a horizontal position or in vertical position either as a down flow or an up flow unit.